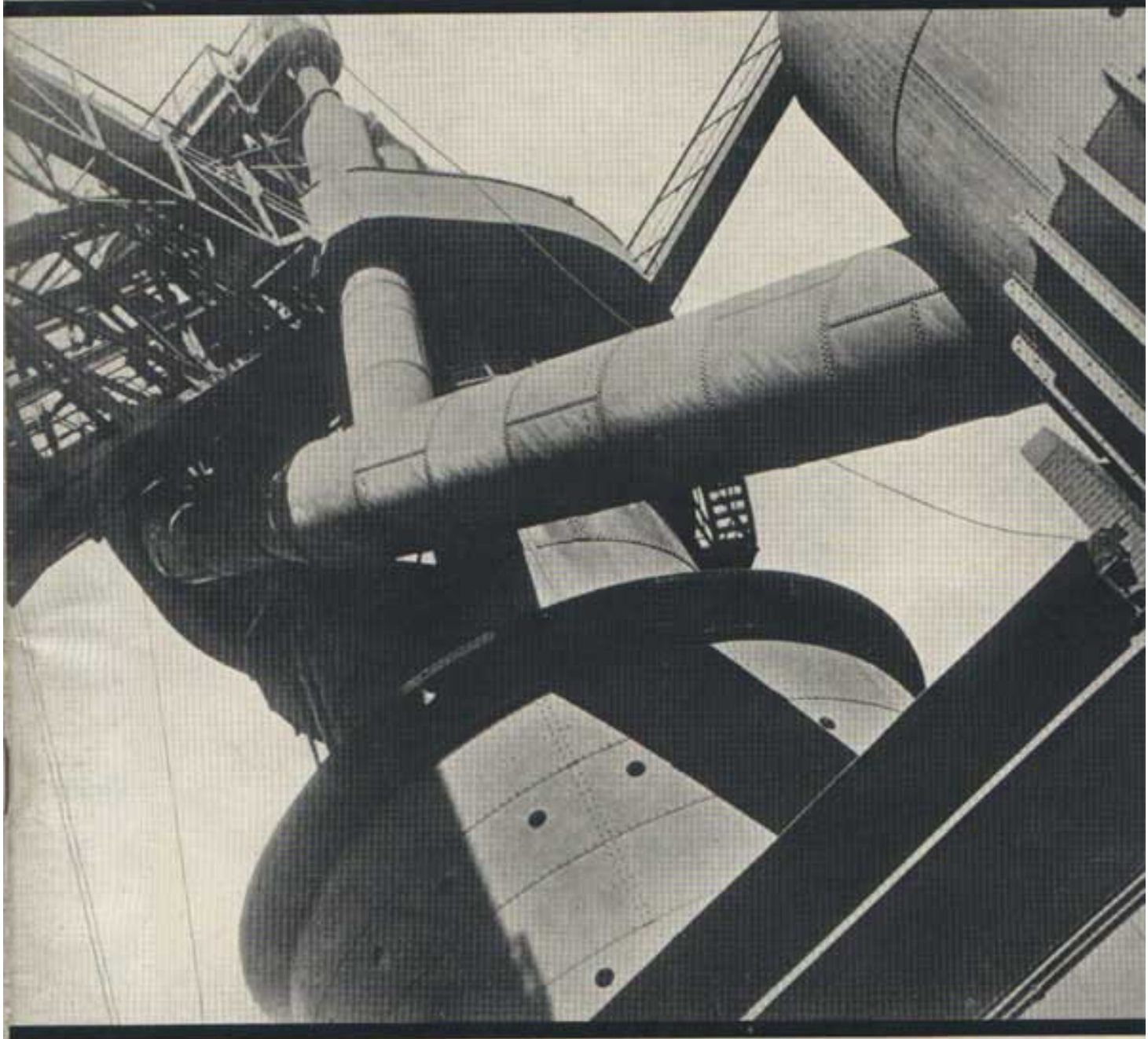
CANADIAN BUSINESS



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Sir Frederick Banting on Russia
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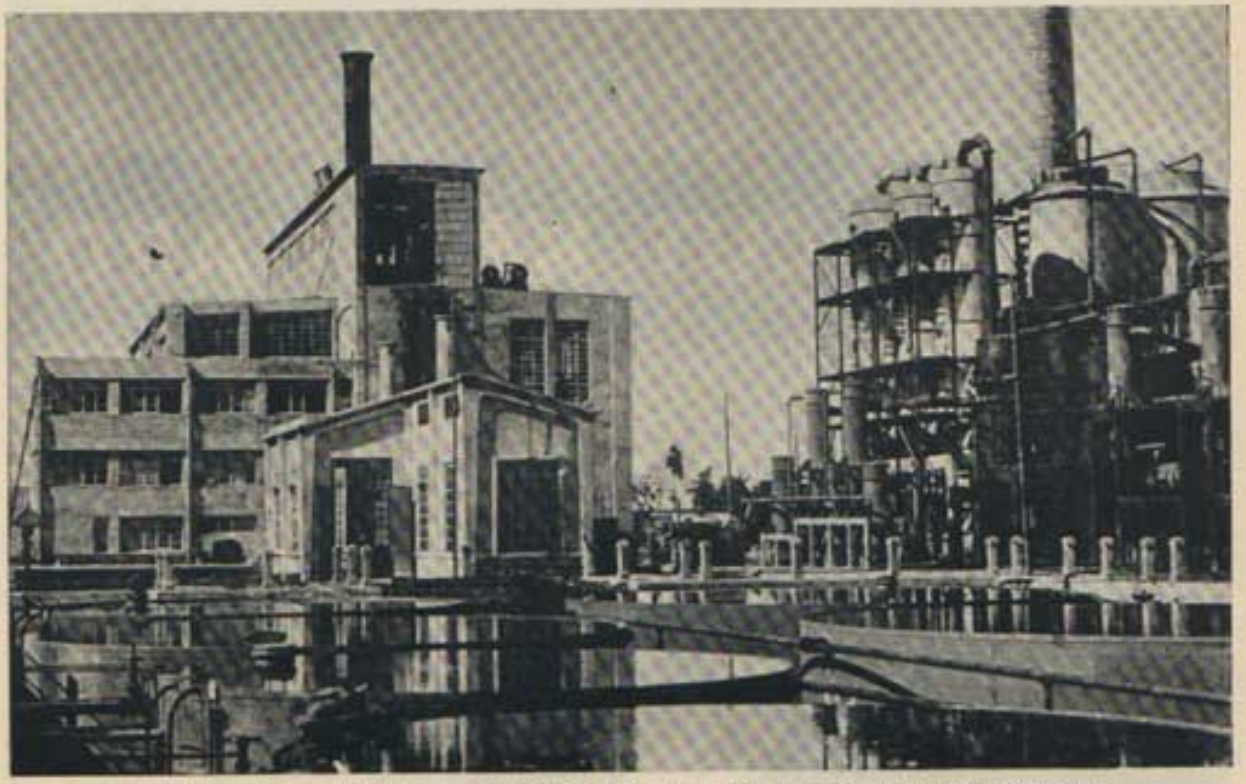

Seeing a modern oil refinery such as this makes it hard to believe that before the revolution, Russia was one of the least industrialized countries of the world

SCIENCE and the SOVIET UNION

By SIR FREDERICK BANTING, K.B.E.

THE greatest experiment that the world has ever known, has just been carried out within the Soviet Union. This experiment involved the lives of 170,000,000 people who use 189 languages or dialects and who occupy nearly one-sixth the land surface of the globe. It was an experiment of government. In the successful carrying out of this experiment, science was a major factor. Science and the fruit of science had been almost denied these people from the beginning of their history, until 1917. The Bolsheviks suffered privation, fought and if necessary died for those far-sighted leaders who promised the people education and science.

In order to understand the situation in the Soviet Union today it is necessary to realize that before the revolution only about ten people out of every hundred could read and write. The country was one of the least industrialized in the world. The vast majority of the people were backward, down-trodden peasants who lived on farms or in small villages. Of the 170,000 doctors (at the rate of 1 doctor per 1,000 population) required for the medical care of the people, there were but 19,000, and these were for the most part located in the cities of the west and in the army and navy. The country was about 100 years behind the rest of civilization. The problem that faced the new government in 1917-18 was gigantic; nor could the task be commenced until the bloody revolution was accomplished. During the past ten years progress has been stupendous.

Education

Education was one of the first aims of the new regime. As early as 1919 a society was formed to liquidate illiteracy. The idea was to help one another. The membership rose to over 3,000,000; for example, during 1931 over 19,000,-

000 adult people learned to read and write. The schools were crowded to capacity, there being morning, afternoon and evening classes. Thousands of new schools were built. At present every child must attend school until 15 years of age. During the first "Five-Year Plan" 15,500,000,000 rubles were spent on education. By the commencement of 1933 there were 485,000 students in universities, 913,000 in technical schools, 435,000 in workers' faculties, 1,500,000 in the apprenticeship and crafts schools, more than 4,350,000 in secondary schools and more than 19,000,000 in elementary schools. The Soviet school taught children in 70 different national languages.

The education of medical students has been carried out in the same increasing scale. The number of doctors has now increased from 19,000 to about 60,000, and they are adding about 10,000 per year. Because of almost universal hospitalization of all sick people, they will not require as many doctors as other countries, since a doctor can attend more patients in a hospital ward than in scattered homes.

Not only have they made great advancement in the teaching of medicine and the application of public health measures, but they have laid the foundations for the advancement of medical science through research.

The government of the Soviet Union gave 15,698,398 rubles in 1933, 31,517,418 rubles in 1934 and 35,780,748 rubles in 1935 to the All-Union Institute of Experimental Medicine, for the purpose of Medical Research. "Appropriations for the construction and equipment of the buildings will exceed 100,000,000 rubles."

The training of engineers of all kinds has received particular attention. The foreign engineer is being rapidly replaced by the young graduates of the Soviet Universities. Their motor car and tractor plants, electric power stations, (heavy industries of all kinds), farm implement foundries, their mines and their metal works require an ever increasing number of trained workers.

Scientific Research

In most countries the science professor of a university takes little heed of the application of scientific principles to industry. Germany was the first country to utilize scientists in industry, and for this reason she became the leader in the manufacturing of chemicals, dyes and precision instruments. United States followed Germany's example. In the Soviet Union there was a two hundred year old "Academy of Science" consisting of 93 Academicians. This body represented the trained minds in the various branches of science—Biology, Mineralogy, Physics, Chemistry and Botany, as well as in the cultural subjects, and had museums, botanical gardens and a library of 3,500,000 volumes. In 1929 the Academy of Science, imbued with the new spirit, volunteered "to study the country's productive forces and contribute to their utilization and to elaborate the methods of applying the scientific theories and the results of scientific experiments and observations to the tasks of socialist construction in the U.S.S.R." This group of scientists devoted themselves assiduously to the problems of state. Their scientific knowledge was applied to the development of electric power, mining, industry of all kinds, and particularly to agriculture. The government backed them with adequate financial support: In 1928 the budget was 3,903,000 rubles; in 1933—16,746,000 rubles, and in 1934—44,500,000 rubles. These investments, in research, have yielded dividends in thousand-fold results.

Today, scientific research and the application of science to industry and agriculture is the most impressive activity in the Soviet Union. There is no country in the world that is progressing so rapidly in this regard. They wished to improve their domestic animals—horses, cattle, sheep and hogs. Their herds were depleted and destroyed during the revolution. They could not afford to import whole herds of the best stock but they did succeed in obtaining with the limited credit in foreign countries some few pure bred animals. These had to be made go as far as possible. Artificial insemination has found a very wide application in the U.S.S.R. The number of females to one pedigree male was very much increased. "The record fertilization of sheep, for instance, is 2,500-2,700 sheep to one ram, instead of

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TODAY, scientific research and the application of science to industry and agriculture is the most impressive activity in the Soviet Union. There is no country in the world that is progressing so rapidly in this regard. So states the distinguished co-discoverer of insulin in this exclusive article written especially for Canadian Business

will be given further attention this session but the actual job will not be tackled until 1937. The situation in Australia and Argentina has given Canadian wheat sellers cause for hope, but Russia is still an uncertain factor. The hopeful fact remains that much more Canadian wheat is being marketed in Europe, while the United States will take a considerable quantity before the spring. All the signs of the times rob business men of any excuse for apologizing for their deep confidence in recovery.

Science and the Soviet Union

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25-40 under natural conditions." During the year 1935, 5,000,000 sheep were artificially inseminated. The report further states: "the full capacity of one bull by the artificial method is not yet known, since the largest herd available for testing numbered only 12,000 cows, all of which were successfully impregnated from the one breed animal." Extensive research work is in progress on the preservation and transportation of the materials. This research has been of inestimable value.

New Products

The scientists have not only taught the students of all their branches of science but have directed extensive research in many lines. In agriculture, for example, the engineers have developed many new kinds and types of machinery. These include: tea harvesters, universal fodder-making machines, harvesting combines for harvesting sunflowers, soya beans, rice and oil-bearing plants, seed cleaning machines, etc. It has been estimated by the All-Union Institute of Mechanization and Electrification of Agriculture that the total labour-saving effect of all these achievements amounts to 432,123,000 man-days of labour.

The world-famous Soviet scientist, Michurin, who is a second Burbank, is experimenting on tobacco, grapes, peaches, apples and pears in an effort to enable them to grow farther north. His amazing experiments have given rise to the stoneless plums.

In the new experimental stations that are springing up all over Russia, scientific research is being applied to the study of all sorts of diseases of grains, plants and animals. Experiments are being carried out for the control of weeds, since nothing will decrease the yield of grain per acre like weeds. From the world's stock of grains the U.S.S.R. has obtained 500 varieties of wheat, 246 samples of barley, as well as numerous kinds of oats, buckwheat, beans, peas, flax, cotton, etc. These grains and plants are being experimented with in all sorts of ways, with the view of obtaining the best yields in the various districts and under the varied conditions that exist in the Soviet Union. Whole plantations of citrous fruits are being sent out in the southern part of Russia. One may drive for hours through the new tea plantation around Batum or the new tobacco plantation about Yalta. By the cultivation of the rubber plant the Soviet Union will be ultimately independent of the rest of the world for her rubber supply.

At the recent conference in November, 1935, thirty-two academicians and five hundred scientific research workers were gathered together in a conference on livestock and wheat problems. It was formerly thought that wheat could only be grown on the black earth belt of central Russia, but the research on soil, fertilizers and varieties of wheat have now made it possible for Babilov to state that the potential wheat land in the Soviet Union amounts to 812 million acres, as compared with 910 million acres suitable for wheat in the United States and Canada combined. Of the 400 million acres of wheat now sown throughout the world, the Soviet Union has about 92 million acres.

Russia is now using much more of her own wheat. In 1934 the grain harvest was far greater than that

of 1913, yet the export in 1934 was one-tenth of that of 1913. In 1933 she exported 25 million bushels of wheat and in 1934 only a little over 7 million bushels. In one of the southern cities I had a long conversation with a very intelligent "member of the party". I asked him if the Soviet Union was going to flood the world market with wheat. He explained that this was not the case, since the southern wheat lands were now being planted with citrous fruits, tea and tobacco. Furthermore, they were not interested in world markets except in so far as they could sell their products for the purpose of raising foreign credits. These foreign credits would be used to buy in those foreign countries the needed commodities which could not be obtained or produced within the Soviet Union.

The same problem of buying in foreign countries led the Soviet Union to send her geologists and mining engineers to search for gold for export. In 1928 the new Soviet gold was worth $31,000,000; in 1933 it was $93,000,000; in 1934 it surpassed Canada and the United States in producing $150,000,000 in gold. The latest reports indicate that in 1936 the Soviet Union will exceed the $400,000,000 production of South Africa. The Soviet Union has paid off nearly $700,000,000 of foreign debts during the past four years. It is estimated that their foreign debt is now less than $150,000,000. She is not interested in gold reserves and thus her gold alone will give her $500,000,000 foreign credits during 1936.

Natural Resources

Russia is investigating her natural resources. In one coal field 670 billion tons of coal have been mapped out. In 1932, 27 million tons of oil were taken from her wells. Whereas formerly these materials were "raw products", now they are being scientifically investigated and utilized to the full. Electric power has been developed with tremendous rapidity. It increased from 520,000 K.W. at the beginning of the "Five-Year Plan" to 4,050,000 K.W. in 1932, in which year 800 million rubles were invested in further development.

The average monthly output for the first 11 months of 1935 was as follows: locomotives 152, cars 7,875, trucks 6,316, passenger cars 1,600, tractors 12,611, combines 1,796. All of these huge enterprises require men of executive capacity, intelligence, foresight and judgment. These qualities are to be found in the men who rise to office within the Soviet Union. The life and activities of their great commercial and industrial men do not greatly differ from the life and activities of industrial men in our country—nor does the financial man—banker and organizer of industry differ so much from those that perform this service in other countries. There are privileges and luxuries that our financial leaders buy. In the Soviet Union these privileges and luxuries are given to him by the people. They honour service. Honour, appreciation and trust of comrades spur and inspire men to plan and work for the common good of all. Man cannot exploit his fellow man. There is no unemployment in the Soviet Union. Conditions are improving very rapidly. Everyone is tremendously enthusiastic. The health of all is cared for by the state. All people have the opportunity to rise as high as their talent and industry will permit in whatever field of endeavour they may select. Every person's future is invested in the state. The state in turn provides for the education of children and an old age pension. This sense of security brings happiness and peace of mind and permits true culture.

Pasteur, the great French scientist, said: "The future belongs to science and woe to the nations that close their eyes to this fact". The Soviet Government is building a gigantic structure on the solid rock of science and research. For this reason there now remains not a vestige of doubt as to the future success of the Soviet Union. Her future is doubly secure because no people in the world so fully realize that the science of today is the research of yesterday, and the research of today is the science of tomorrow.

The Natural Business Year

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well have a September 30th fiscal year—the end of the biggest selling season and before stocks are about to be built up for the next season. Most of the milling and grain companies end their years in the summer months, because the grain year is from August to August. Perhaps a dozen other classifications would find a better year-end than December 31st.

63 Per Cent in January

The official organ of the Dominion Association of Chartered Accountants some months ago published a table showing that of 423 Canadian companies which make their financial statements public, no less than 270, or 63.8 per cent, end their years on December 31st. The next highest group was 29 which report as of March 31st. The claim is not made that all of the December companies reasonably or wisely could change to another date. In some lines, December 31st might be best. In the wholesale trade, the Christmas rush is over early in December except for comparatively small repeat orders. The staffs are inclined to take a breather in that season and the sharp line of demarcation in this season would seem to make it a more logical period for stock-taking than even, say, the summer when one season is apt to lag over into another. Several of the chartered banks end their years as at October 31st or November 30th but insurance companies and trust companies are directed by law to close their books as of December 31st.

For Welfare of Workers

So much for the purely material side of endeavoring to find what is the best date for closing the books for the year. There remains the question of welfare of the thousands of people directly and